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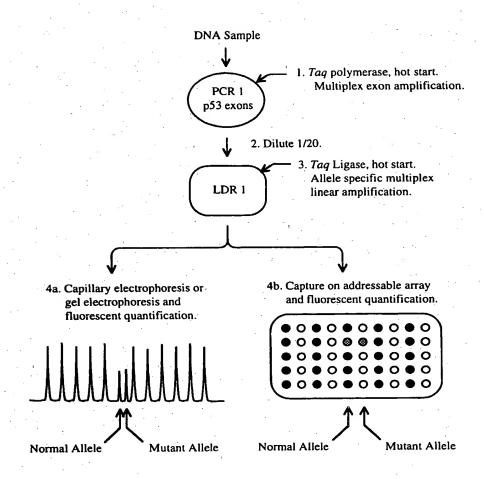


FIG. 1





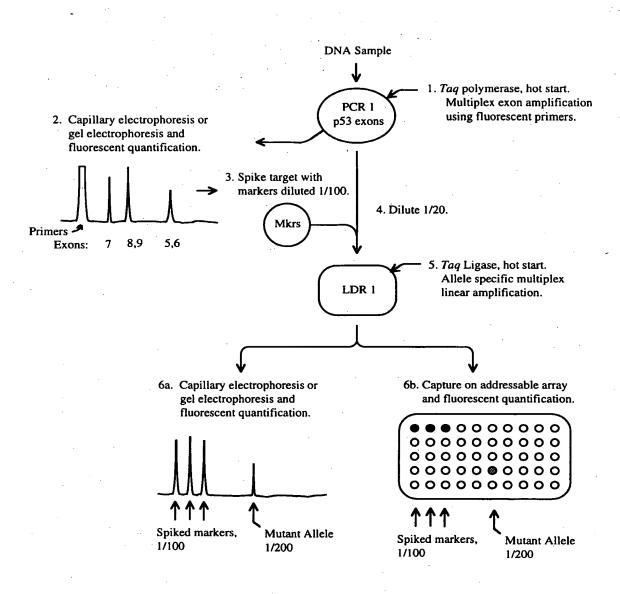
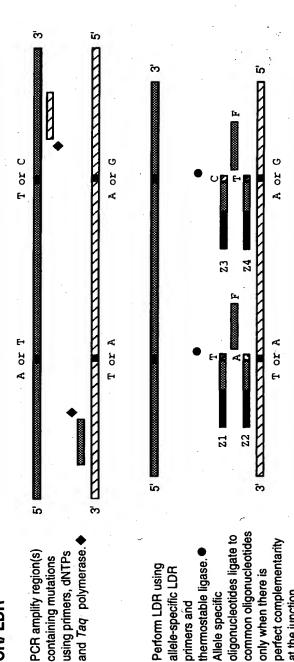


FIG. 2



PCR/ LDR

using primers, dNTPs and *Taq* polymerase.◀ 1. PCR amplify region(s) containing mutations



thermostable ligase.

primers and

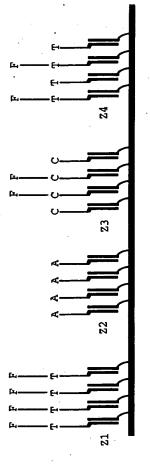
Allele specific

only when there is

at the junction.

2. Perform LDR using allele-specific LDR

products on addressable array and quantify each 3. Capture fluorescent allele.



Homozygous: T allele only.

Heterozygous: C and T alleles.

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3 Experience of the Control of the C

23 72

common oligonucleotides

2. Perform LDR using allele-specific LDR

primers and

perfect complementarity

at the junction.

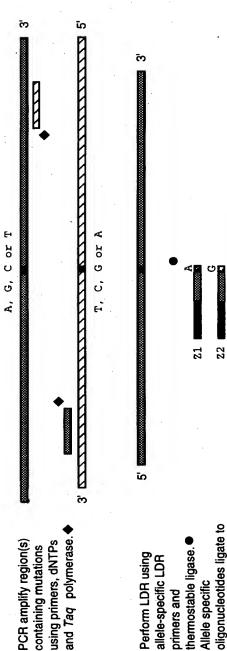
only when there is

T, C, G or A



PCR/LDR

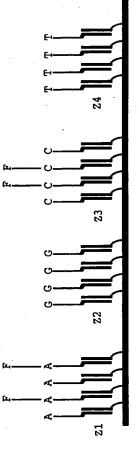
using primers, dNTPs and Taq polymerase. 1. PCR amplify region(s) containing mutations



3. Capture fluorescent

products on addressable array and quantify each

allele.



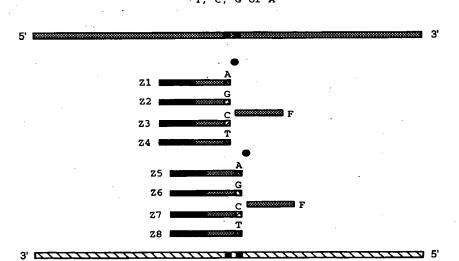
Heterozygous: A and C alleles.

PCR/LDR: N arby alleles

- PCR amplify region(s) containing mutations using primers, dNTPs and Taq polymerase.
- A, G, C or T

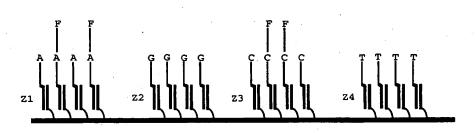
 5'

 T, C, G or A
- 2. Perform LDR using allele-specific LDR primers and thermostable ligase. Allele specific oligonucleotides ligate to common oligonucleotides only when there is perfect complementarity at the junction.

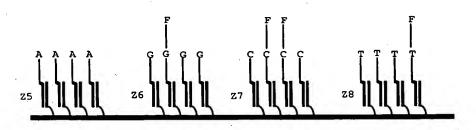


T, C, G or A

 Capture fluorescent products on addressable array and quantify each allele.



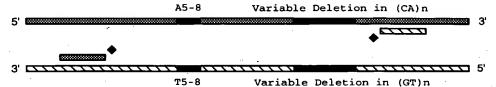
Heterozygous: A and C alleles.



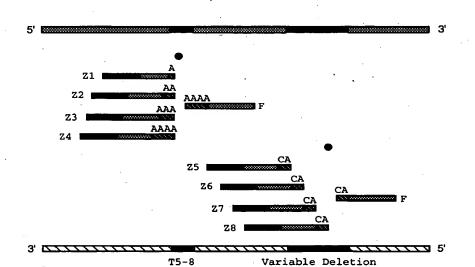
Heterozygous: G,C, and T alleles.

PCR/ LDR: Insertions and Deletions

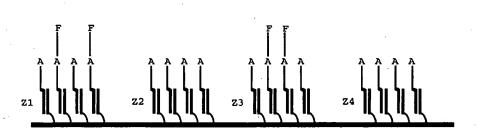
 PCR amplify region(s) containing mutations using primers, dNTPs and Taq polymerase. ◆



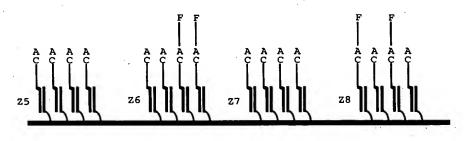
2. Perform LDR using allele-specific LDR primers and thermostable ligase. ● Allele specific oligonucleotides ligate to common oligonucleotides only when there is perfect complementarity at the junction.



 Capture fluorescent products on addressable array and quantify each allele.



Heterozygous: A5 and A7 alleles.



Heterozygous: (CA)5 and (CA)3 alleles.



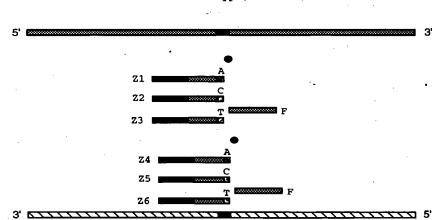


PCR/ LDR: Adjacent alleles, cancer detection

- PCR amplify region(s) containing mutations using primers, dNTPs and Taq polymerase.
- Wildtype, GG

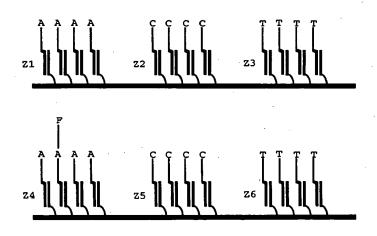
 5'

 Wildtype, CC
- 2. Perform LDR using allele-specific LDR primers and thermostable ligase. Allele specific oligonucleotides ligate to common oligonucleotides only when there is perfect complementarity at the junction.



Wildtype, CC

 Capture fluorescent products on addressable array and quantify each allele.



Gly to Asp mutation

PCR/ LDR: Nearby alleles

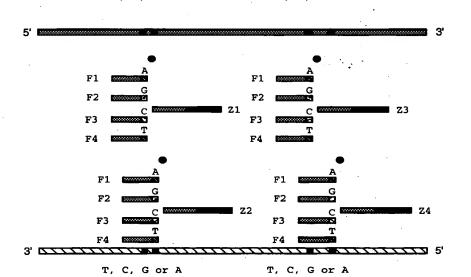
- PCR amplify region(s) containing mutations using primers, dNTPs and Taq polymerase.
- A, G, C or T

 A, G, C or T

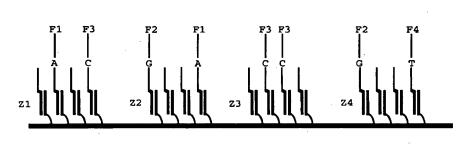
 5'

 T, C, G or A

 T, C, G or A
- 2. Perform LDR using allele-specific LDR primers and thermostable ligase. Allele specific oligonucleotides ligate to common oligonucleotides only when there is perfect complementarity at the junction.



 Capture fluorescent products on addressable array and quantify each allele.



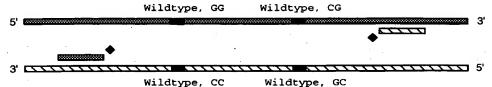
Heterozygous: A and C alleles.

Heterozygous: A and G alleles.

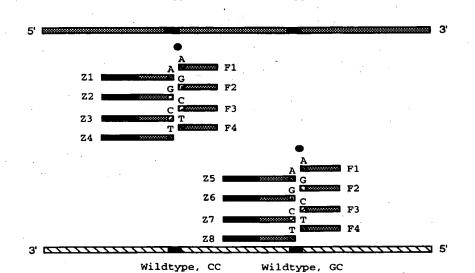
Homozygous: C allele. Heterozygous: G and T alleles.

PCR/ LDR: Adjacent and Nearby alleles

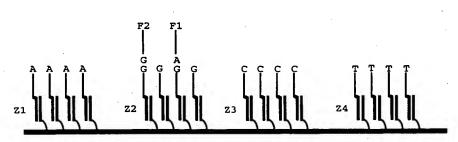
 PCR amplify region(s) containing mutations using primers, dNTPs and Taq polymerase.



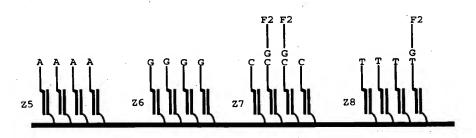
2. Perform LDR using allele-specific LDR primers and thermostable ligase. ■ Allele specific oligonucleotides ligate to common oligonucleotides only when there is perfect complementarity at the junction.



 Capture fluorescent products on addressable array and quantify each allele.



Heterozygous: Gly and Glu alleles.



Het rozygous: Arg and Trp alleles.



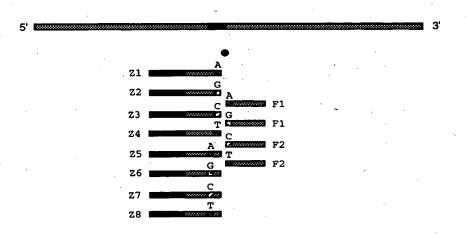
PCR/LDR: All all les of a single cod n

 PCR amplify region(s) containing mutations using primers, dNTPs and Taq polymerase. Wildtype, CAA

5'

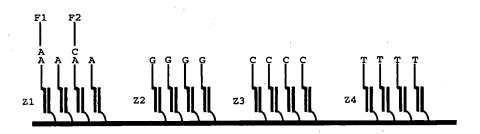
Wildtype, GTT

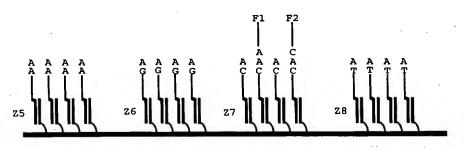
2. Perform LDR using allele-specific LDR primers and thermostable ligase. ● Allele specific oligonucleotides ligate to common oligonucleotides only when there is perfect complementarity at the junction.



3' Wildtype, GTT

 Capture fluorescent products on addressable array and quantify each allele.





Heterozygous: Gln and His alleles.





```
Y-PEG
      X
                                                  (Y)-PEG-Y*
X,Y
                                        X^*, Y^* =
                                                           -O(C=O)Z
            -OH
                                                           -O(C=S)Z
             -CO<sub>2</sub>H
             -NH2
                                                           -CO<sub>2</sub>H
                                                           -(C=\bar{O})Z
(Y)
             W-NH-
                                                           -NH_2
                                                           -N=C=O
W = protecting group, e.g. Boc, Fmoc
Z = activating group, e.g. imidazole (Im), p-nitrophenol (OPnp),
            hydroxysuccinimide (OSu), pentafluorophenol (OPfp)
PEG = oligo or poly(ethylene glycol), backbone (CH_2CH_2O)_n n = 6 to 200 (can also be grown by anionic polymerization with \frac{1}{O})
WSC = water soluble carbodiimide
Functional group transformations/activation (as needed), X \rightarrow X^*, Y \rightarrow Y^*
-OH \longrightarrow -O(CH_2)_nCO_2H  n = 1, 2
-OH \rightarrow -O(C=O)NHCH_2CO_2H
-OH \rightarrow -O(C=O)CH_2NH_2
-OH \longrightarrow -O(C=O)Im
-OH \rightarrow -O(C=S)SCH_2(C=O)NH_2
-CO_2H \rightarrow -(C=O)NH(CH_2)_nNH_2
                                            n = 2.6
-CO_2H \longrightarrow -(C=O)Z
-NH_2 \rightarrow -NH(C=O)(CH_2)_nCO_2H  n = 2, 3
Covalent linkage, X* + Y*
-CO_2H + H_2N - + WSC + HOSu \rightarrow -(C=O)NH
-OH + Im(\bar{C}=O)Im + H_2N - \longrightarrow -O(C=O)NH
-OH + O=C=N- \longrightarrow -O(C=O)NH-
```

FIG. 11

 $-OH \rightarrow -OCH_2(C=O)H + H_2N - + NaCNBH_3 \rightarrow -OCH_2CH_2NH -$

 $+ HO - \longrightarrow -OCH_2CH(OH)CH_2O-$

 $-O(C=S)SCH_2(C=O)NH_2 + H_2N - \longrightarrow -O(C=S)NH_-$

 $(+H_2NH_-)$

-OH + ClCH₂



PECENER 15 2000

Ac-Cys-Probe +
$$N-(CH_2)_nC-Support$$
 $N = 1, 2, \text{ or } 5$
 $pH 8$
 $CH_3C-N-CH-C-Probe$
 CH_2
 CH_2





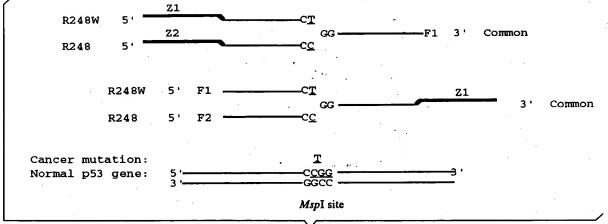
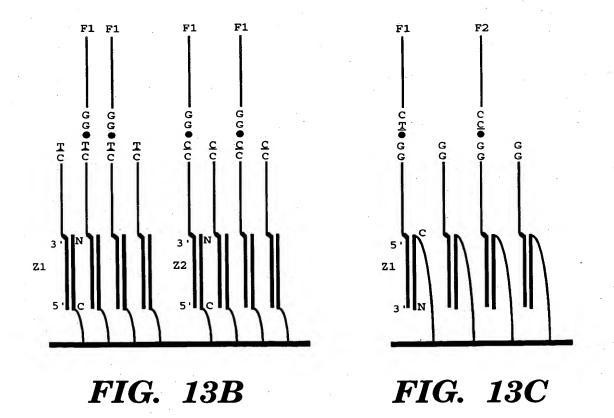


FIG. 13A





A B C D E F G H I J K L M N O

FIG. 14A

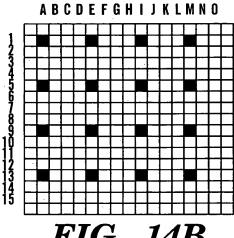
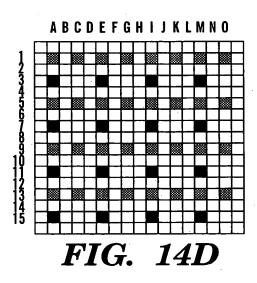
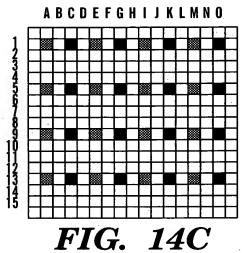
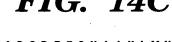
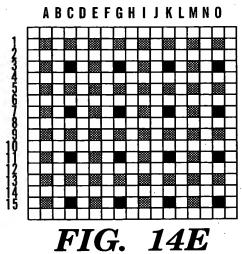


FIG. 14B









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FIG. 15A

1st addition of unique 24mers.

FIG. 15B

2nd addition of unique 24mers.

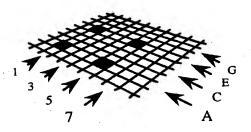
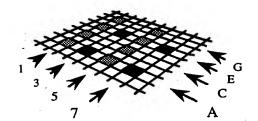


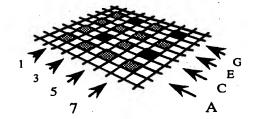
FIG. 15C
3rd addition of unique 24mers.

To A A

FIG. 15D

4th addition of unique 24mers.





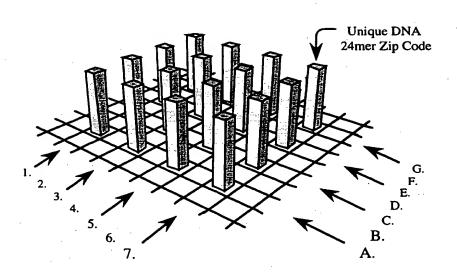


FIG. 15E



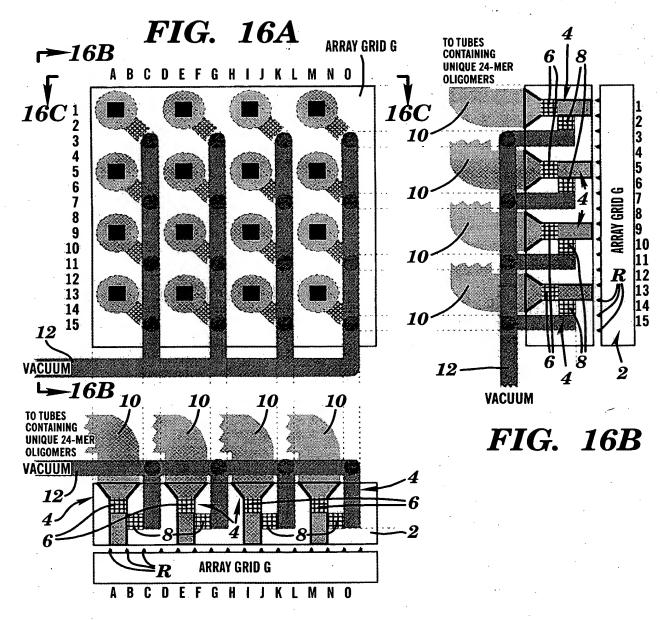


FIG. 16C



2ND TWO BASES 1ST TWO BASES GC GG GA AT AC AG AA TC TG TA CT CC CG CA GT TTGA TTAG 23 6 8 16' TCTG 1 TCGT TCCC TC 6 30' TGAT 7 TGTC TGCG TG [11] 364 TACA 36 TA 18' 33' CTTG CTCA CTGT CT 8 32' 13 CCAT CCTA CC 15 29' CGTT CGAA CG 4' 28 10 12' 16 CAGC 12 CAGC CA 9' 34' 14 Įĩ' 25 GTGC GTCT GT 24' 31' 19 22 CGTT 17 GCAA GC 22' 14 23 GGTA 18 GGAC GG 3' 24 20' 35' GACC GATG 34 GAGT 21 GA 2' 20 ATAC ATCG AT 31 28 7 15 ACCT 27 ACGG AC 5' 29 13 ' 21' AGCC 35 AGGA AGTG 25 AG 27' 30 19' AAAG 32 AATC 26 AA 10' 17'

FIG. 17



1st Tetramer addition (columns)

1	2	3	4	5	
1	2				
1	1	$\lceil \rceil \rceil$		'	
1	2	3	4	5	
1	2	3	4	5	
1	2	3	4	5	

FIG. 18A

4th Tetramer addition (rows)

2	2	2	2	2
1	1	1	1	1
6	6	6	6	6
5	5	5	5	5
4	4	4	4	4

FIG. 18D

18/34

2nd Tetramer addition (rows)

6	6	6	6	6
5	5	5	5	5
4	. 4	4	4	4
3	3	3	3	3
2	2	2	2	2

FIG. 18B

5th Tetramer addition (columns)

_		_		_
6	1	2	3	4
6	1	2	3	4
6	1	2	3	4
6	1	2	3	4
6	1	2	3	4
-				ليسا

FIG. 18E

3rd Tetramer addition (columns)

3	4	5	6	1
3	4	5	6	1
3	4	5	6	1
3	4	5	6	1
3	4	5	6	1

FIG. 18C

6th Tetramer addition (rows)

3	3	3	3	3
2	2	2	2	2
1	1	1	1	<u>, 1</u>
6	6	6	6	6
5.	5	5	5	5

FIG. 18F

Addressable array with full length PNA 24mers

		_		_				
			,					
1-6-3-2-6-3		2- 6-4 -2-1-3		3- 6 -5-2-2-3		4-6-6-2-3-3	5-6-1-2-4-3	
							α.	
1-5-3-1-6-2		2-5-4-1-1-2		3-5-5-1-2-2		4-5-6-1-3-2	5-5-1-1-4-2	
1-4-3-6-6-1		2-4-4-6-1-1		3-4-5-6-2-1		4-4-6-6-3-1	5-4-1-6-4-1	
				·				
1-3-3-5-6-6		2-3-4-5-1-6		3-3-5-5-2-6		4-3-6-5-3-6	5-3-1-5-4 <i>-</i> 6	
					·			
1-2-3-4-6-5	_	2-2-4-4-1-5		3-2-5-4-2-5		4-2-6-4-3-5	5-2-1-4-4-5	
							<u> </u>	

FIG. 18G



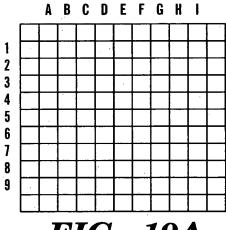


FIG. 19A

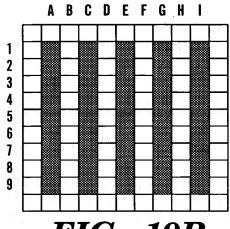


FIG. 19B

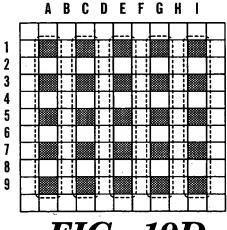
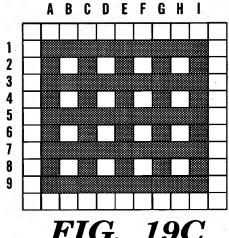


FIG. 19D



19C FIG.

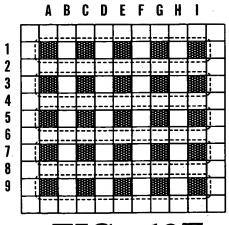


FIG. 19E

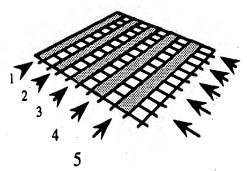


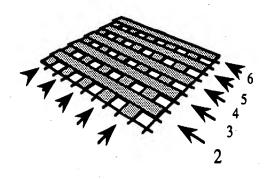
FIG. 20A

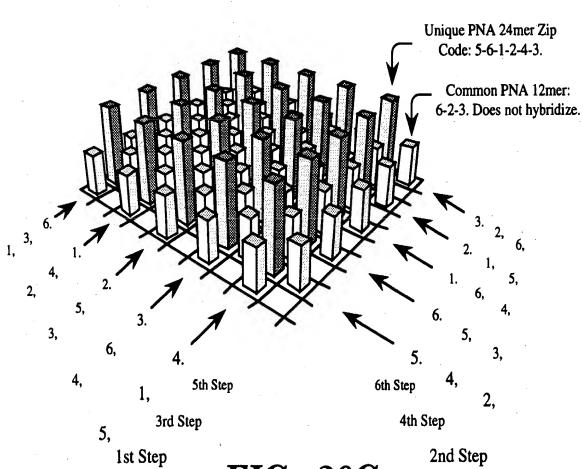
1st Tetramer additions (columns)

FIG. 20B

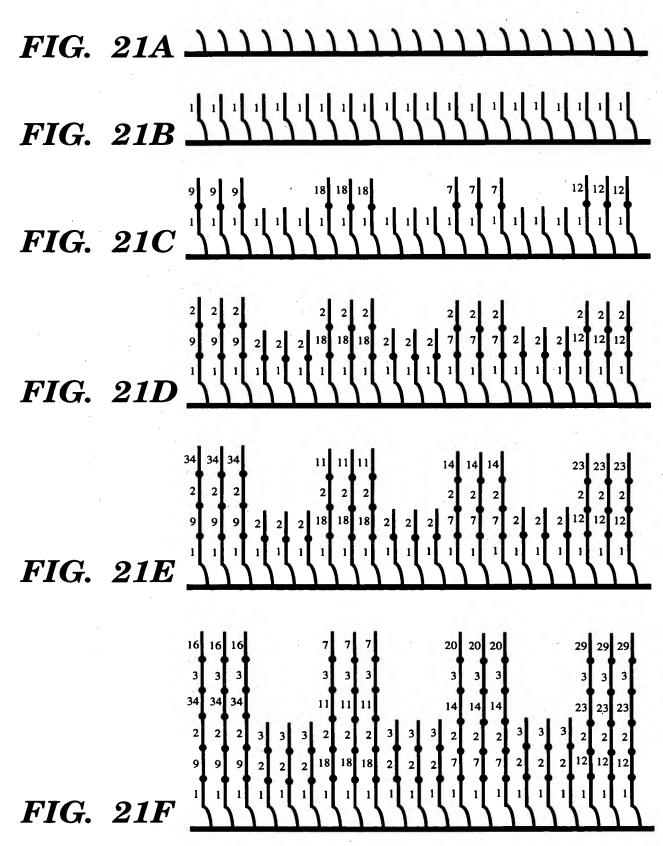
2nd Tetramer additions (rows)





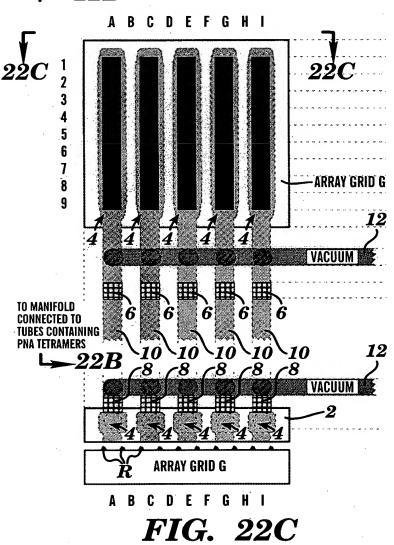








-22B FIG. 22A



2 4

5 GIND AVAILABLE

1 2

3 4

5 6

7 8

9 10

10

10

TO MANIFOLD CONNECTED TO TUBES CONTAINING PNA TETRAMERS

FIG. 22B



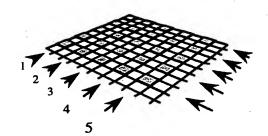
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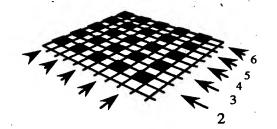
FIG. 23A

1st Tetramer additions (columns)

FIG. 23B

2nd Tetramer additions (rows)





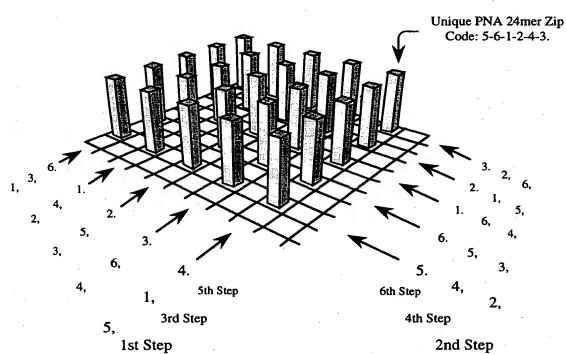


FIG. 23C

TOP OF THE PARTY O



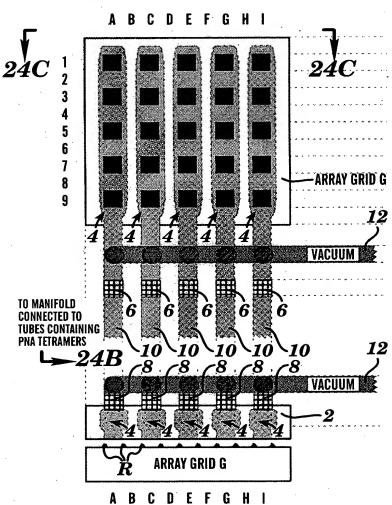


FIG. 24C

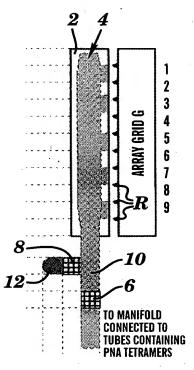
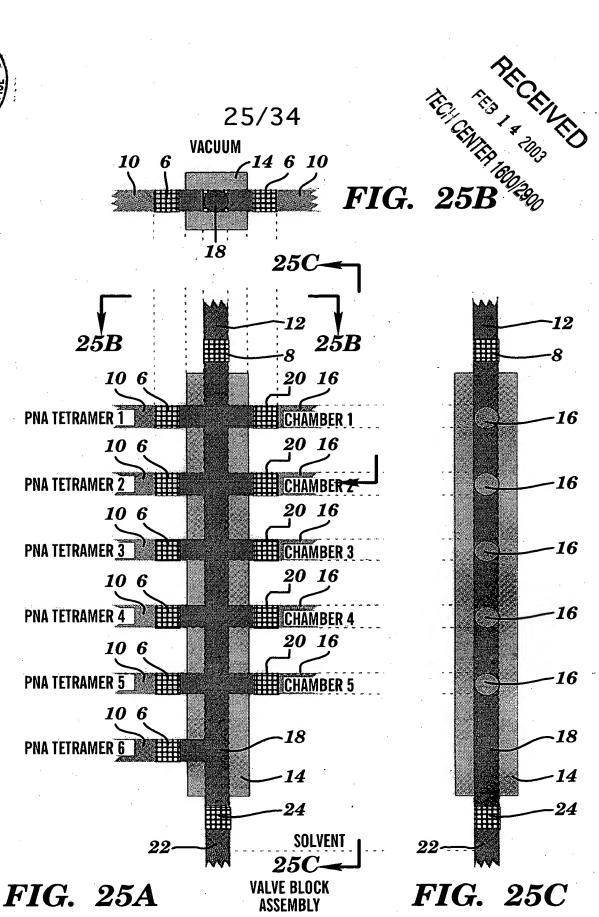
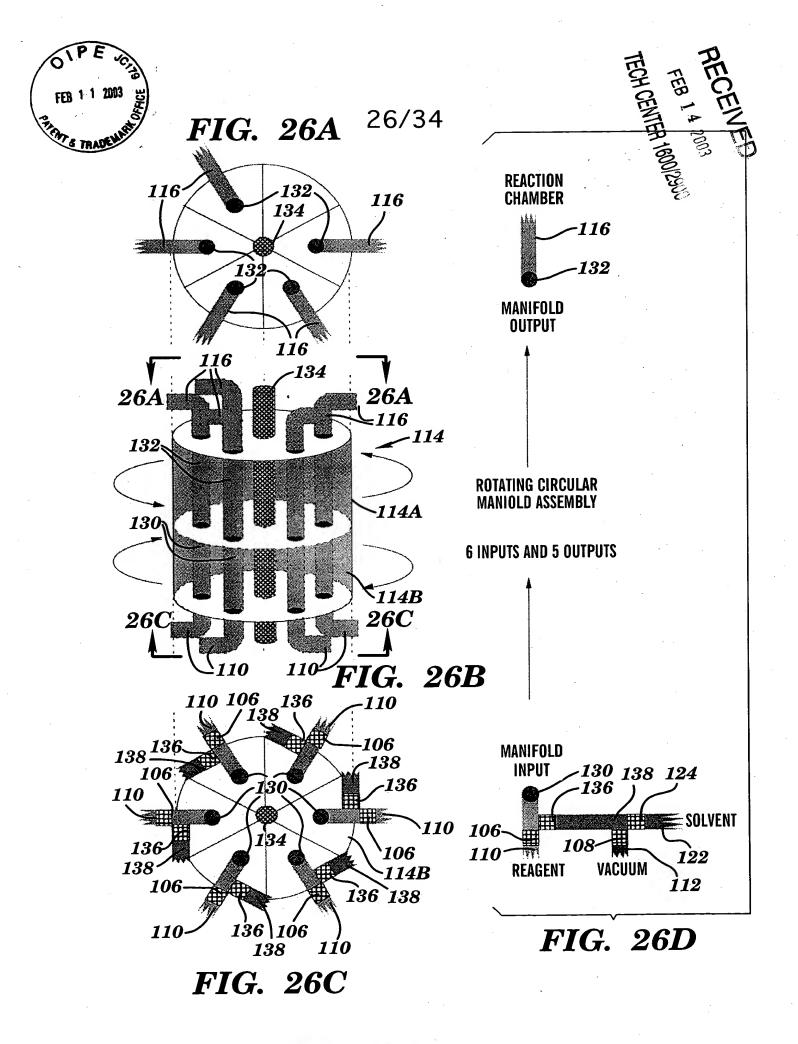


FIG. 24B





6 INPUTS AND 5 OUTPUTS





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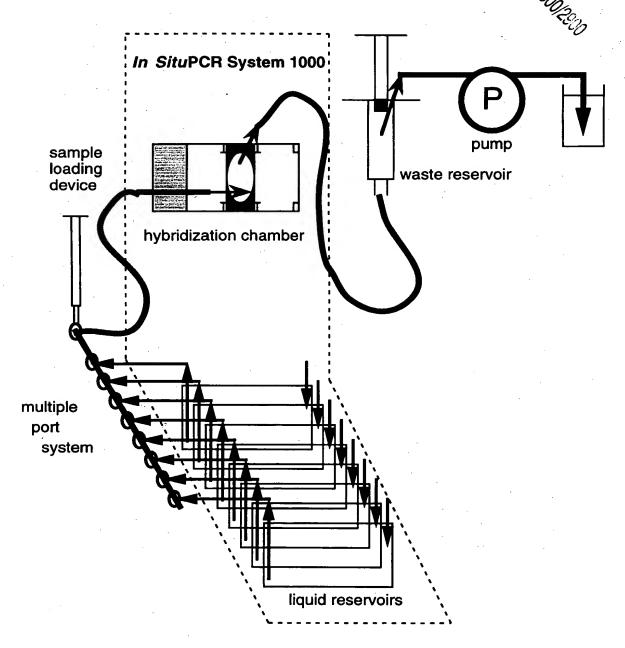


FIG. 27



TEXT THE TANK TO SO THE PARTY TO SO THE PARTY

-C00H; PROBE 12

-COOH; PROBE 14

-NH2; PROBE 12

-NH2; PROBE 14



POLONIA DOSON

2% EGDMA

2% HDDMA

4% EGDMA

1 2



FIG. 31

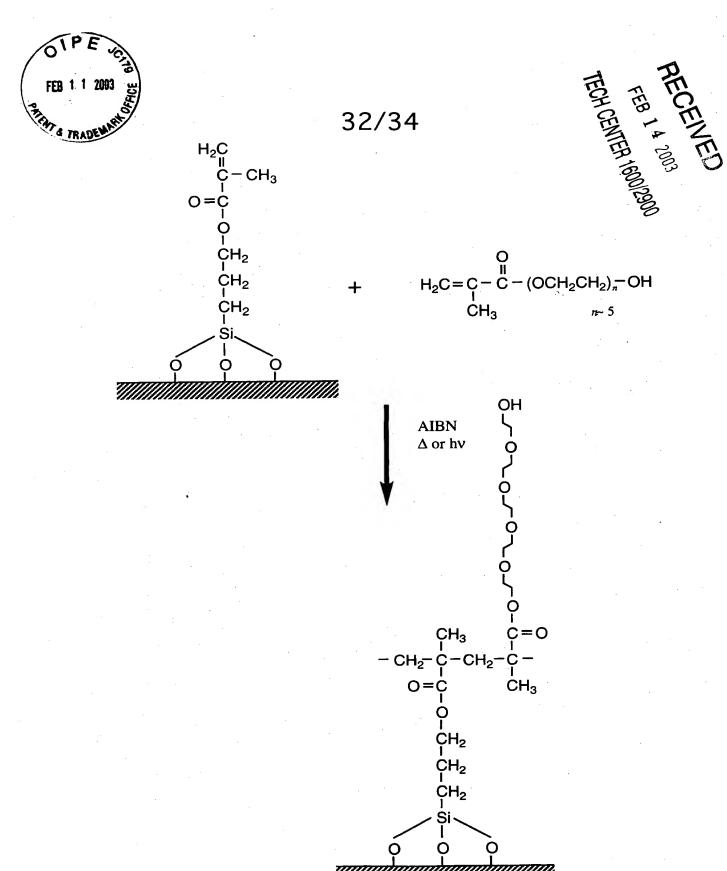


FIG. 32



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FIG. 33



FIG. 34